

ANNEX

RECOMMENDATIONS FOR VENTILATION OR INERTING OF DOUBLE HULL SPACES

INTRODUCTION

1 SOLAS Regulation II-2/59.4 requires oil tankers constructed on or after 1 October 1994, to be provided with suitable arrangements for gas freeing and ventilation of double hull spaces. In addition, oil tankers fitted with inert gas systems are required to have suitable arrangements for inerting double hull spaces, when necessary.

2 The recommendations contained in this annex are intended to provide an advice for alternative solutions available and indicate acceptable arrangements.

GAS FREEING AND VENTILATION

3 The gas freeing and ventilation arrangements must be capable of gasfreeing:

- .1 inerted double hull spaces; and
- .2 double hull spaces containing cargo vapours from leakages of cargo into the spaces;

in order to maintain adequate ventilation continuously during entry of personnel.

ALTERNATIVE METHODS OF VENTILATION

4 The following methods of ventilation are feasible;

- .1 filling and subsequent emptying with water ballast,
- .2 using portable gas-freeing fan fitted to tank openings with hose or pipe led to bottom of the tank. Discharge may be through hatch or manhole (See Fig.1,2 and 3). Pipes made of non-metallic material may be accepted if documented to be of electrically conductive type and suitably grounded. For acceptable results in larger L-shaped tanks, the purge pipes should be led inboard to the centreline double bottom girder. An alternative to portable fans is to use inert gas fans;
- .3 same arrangement as paragraph 4.1.2, however extraction from bottom through purge pipe and fresh air supply from deck (see Fig.2.);
- .4 connection between the inert gas line and the water ballast line for fresh air supply through ballast suction (see Fig.3);
- .5 cross-over ventilation (see Fig.4);
- .6 an arrangement utilizing dilution method with inlet and outlet at deck level (see figure 5). This method will require a powerful fan so that the jet will penetrate all the way down to the tank bottom. The high inlet velocity causes turbulent mixing with the tank

atmosphere. The gas being exhausted from the tank is at any time a mixture of the gas supplied and the tank atmosphere. For L-shaped tanks this method alone is normally not considered sufficient, but in combination with air supply through ballast suctions, it may be acceptable; and

- .7 combination of partly filling and ventilation, e.g. filling of double bottom section of U-shaped tanks and ventilation of side spaces;

5 Methods listed in paragraphs 4.1 to 4.5 are based on displacement of gas, which is considered to be the best solution for deep tanks of cellular design.

6 Most hydrocarbon gases from crude oil, hydrogen sulphide and inert gas are heavier than air. With requirements for connections for inert gas supply to ballast tanks, inerting of ballast tanks will probably be a normal procedure. A ventilation arrangement extracting the heavier gases from bottom utilizing portable fans mounted on purge pipes and with fresh air supply from open hatches in deck will probably be an effective gas-freeing method.

7 However, filling of ballast tanks and subsequent emptying is considered as the most efficient way of gas-freeing ballast tanks. Hull strength limitations must be observed.

INERTING

8 The arrangements for inerting of double hull spaces may be through portable connections to the inert gas system for cargo tanks or by fixed piping connections.

9 If fixed piping is used, the arrangement must include a separate deck water seal and a non-return valve in order to prevent communication between vapour spaces of cargo tanks and the double hull spaces. The practices for inerting double hull spaces may either be to keep these spaces inerted at all times when empty, or to inert them only if hydrocarbon gases are detected indicating leakage between cargo tank(s) and the double hull spaces. If the former practice is utilized, a fixed piping system is considered necessary.

METHODS AND ARRANGEMENTS FOR INERTING

10 As for gas freeing and ventilation the easiest method for inerting is to supply inert gas to the space during deballasting. For that purpose an inert gas inlet in the top of the space is needed. However, arrangements must additionally, be provided to enable the space to be purged with inert gas. For this purpose at least L-shaped tanks must be provided with inert gas supply outlets near bottom far ends. Alternative arrangements for inert gas purging will be the same as for ventilation purposes detailed in paragraphs 4,5,6 and 7, replacing portable fan with inert gas supply inlets.

OPERATIONAL PROCEDURES

11 Written procedures should be available onboard giving details on how to carry out ventilation, inerting of cleaning or double hull spaces.
